

Detailed Description of Work

Task Order 15-07: Regional Architecture Update

OBJECTIVES FOR THE REGIONAL ARCHITECTURE UPDATE

The Regional Architecture (RA) Update should meet the following objectives:

1. The RA Update should build on the databases, tools and materials developed as part of the original RA. It is understood that while all previously developed material is owned by MTC, only technical content (e.g., inventory and stakeholder database files) will be reused and revised as needed. Text and summaries, while owned by MTC, are not anticipated to be revised, but will need to be referenced as previously published or rewritten.
2. The RA Update should focus on any new data exchange requirements for existing regional programs (such as electronic payment, traveler information, real-time transit information, freeway management, etc.) and also new programs or services not considered in the last regional architecture (such as emergency communications). The RA Update should help future project developers see how their projects fit into the existing landscape, enabling them to secure project funding and identify data sharing requirements and design/development standards. It is imperative that project sponsors use appropriate standards for system design when conducting procurements to facilitate the cost-effective exchange of data with other projects. The RA Update should be informative for the region's policy-makers in executive summary materials by defining priority integration issues or gaps in interoperability.
3. The RA needs to be a user-friendly, plain English, self-serve, easy-to-access resource to be of use to project planning, funding and procurement staff who often have limited (if any) experience using it. Dissemination of, and education about, the final updated RA should target project planning, funding and procurement staff and be organized accordingly.
4. The RA should require minimal time and money to maintain in between major updates. A critical eye should be turned to the various categories of information in the existing RA, and maintenance should focus on information actually used by project planning and funding staff. The RA should be streamlined to minimize information that is not essential to achieving the objectives outlined in this section.
5. The RA Update should inform the next Regional Transportation Plan (RTP) by proposing some potential components of the ITS program in the region that could be considered in the larger context of the RTP.

PROJECT MANAGEMENT, APPROACH AND WORK PRODUCTS

1. Project Management and Delivery

A. Consultant shall perform:

1. Oversight of all work effort as described in the scope of work, including quality assurance/control.
2. Coordination with the MTC Task Leader to manage, review and revise work.

3. Coordination and facilitation of up to four Regional Architecture Maintenance Committee meetings and two larger stakeholder group workshops (as defined in 2 below), and of materials for feedback on Consultant's approach to work, as well as meeting minutes.
 4. Coordination with Bay Area regional ITS architecture stakeholders to solicit and collect information, as defined in 3 below.
 5. Data entry and management, and work with Turbo Architecture software that supports the development of the RA Update.
 6. Preparation of outlines, draft and final deliverables.
 7. Preparation of invoices and project status reports.
2. Process Oversight
- A. The MTC Task Lead shall be the primary contact for Consultant regarding this task order, the RA update and deliverables review. The Maintenance Committee, a limited and representative group of ITS stakeholders who have agreed to advise MTC on RA issues, will serve as a Technical Advisory Committee (TAC) for the RA Update in terms of providing feedback on Consultant's approach, deliverables and related matters. Apart from the Maintenance Committee, Consultant shall also interact with a broad spectrum of ITS stakeholders in the Bay Area whose primary role is to provide project-specific information in support of the RA Update, and confer with topic specific policy stakeholders (e.g. Freeway Management Executive Committee, Congestion Management Agency (CMA) Association, Partnership Board, etc). The primary means of communication with the Maintenance Committee will be via e-mail and web site. Quarterly meetings with the Maintenance Committee will also be held face-to-face (up to 4). Two workshops with the wider stakeholder base are budgeted in this scope of services (as outlined below).
3. Outreach
- A. Consultant shall use a combination of techniques to involve ITS stakeholders in the RA Update:
1. Basic communication – Consultant shall verify existing and identify new transportation stakeholders and their contact information for cities, counties, congestion management agencies, transit agencies, MTC, Caltrans, CHP and other special purpose agencies as appropriate. Consultant shall conduct outreach via letter, e-mail, phone or face-to-face meeting to gather information and follow-up with stakeholders at various stages in the RA Update process to facilitate their participation. Consultant shall maintain a stakeholder database to manage communications and feedback.
 2. Workshops – Consultant shall conduct two workshops to confirm stakeholder project information, share RA Update project information and identify regional issues to address as part of the update process. Workshops will focus on the broad group of stakeholders that are or may be impacted by the architecture.
 3. Webpage – Consultant shall maintain information about the RA Update at, and gather ITS project information through, the regional ITS architecture

webpage on MTC's website for the duration of the project. All communication will direct stakeholders to this webpage. Consultant shall review the webpage with the MTC Task Lead prior to going 'live' and incorporate feedback prior to going 'live'. The webpage will have the following features:

- a. Project information, including the regional architecture background, objective, contact information, schedule and status.
- b. Project announcements and updates, including meeting schedules, agendas, minutes and materials.
- c. Document publication, including intermediate and final drafts.
- d. Data collection, including means of submitting new and modified ITS projects for inclusion in the RA Update and commenting on draft documents.
- e. Hyperlinked version of the RA, which allows a stakeholder to access only the parts of the RA that affect them. The hyperlinked version will be sorted by stakeholder and potentially by other categories and is structured based on the Turbo Architecture components.

Project webpage establishment and maintenance milestones (one milestone for each of Task 2, 3, 4, 5, and 6) will be payable upon posting of all associated content in each associated task.

4. Work Products

- A. Consultant shall make all oral, printed and web-based communication and deliverables as user-friendly as possible by:
 1. Minimizing industry jargon,
 2. Providing simple explanations of complex terminology,
 3. Using real-life examples to demonstrate different ideas or processes,
 4. Paying attention to the organization of presented information so that it is logical,
 5. Using bulleted text to succinctly organize ideas, and
 6. Generally keeping the audience in mind (in terms of stakeholders providing project information and future users of the RA). Consultant should assume the audience has a limited understanding of the purpose of the RA, its terminology and how to use it.
- B. Consultant shall submit all deliverables in an initial draft format for feedback from MTC staff and as a second draft to the Maintenance Committee and/or regional ITS stakeholders (depending on the deliverable). Consultant shall assume two drafts for every deliverable in addition to the final. Consultant shall allow reasonable time for review and feedback of all draft materials (two week minimum per deliverable) and will make reasonable effort to incorporate feedback into final deliverables. Consultant shall consult with the MTC Task Leader on how to incorporate sensitive or challenging feedback on a case-by-case basis. MTC Task Leader will resolve conflicting comments.
- C. All draft and final deliverables will be submitted as electronic MSWord, Excel or PowerPoint documents, depending on the nature of the deliverable. The exception to this is direct outputs from the Turbo Architecture software. All draft

- and final deliverables for distribution to the stakeholders should also be submitted as PDF (or an appropriate agreed-upon format that facilitates posting documents on MTC's website, e-mailing them, and printing/copying). At the conclusion of the project, Consultant shall organize all electronic final deliverables and their related PDFs as a record of the project and submit three (3) CD copies to the MTC Task Lead. Hardcopies are not budgeted for in this scope of services.
- D. Invoices will be delivered on a monthly basis and each monthly invoice will include all milestones delivered during that month.

SCOPE OF WORK

Task 1: RA Inclusion Criteria

Consultant shall develop guidance for ITS stakeholders on which ITS projects should be included in the RA.

- A. Develop the RA Inclusion Criteria, guidelines for ITS stakeholders about which projects need to be included in the RA. Consultant shall draw from its expertise in the areas of federal regulations and USDOT policy related to the RA to inform this task. Consultant shall brainstorm opportunities and approaches to streamlining the RA. Consultant shall solicit feedback from the Maintenance Committee on its ideas and identify any additional options worth pursuing. Feedback will be taken into consideration when finalizing the draft criteria for MTC approval. As part of the guidance, Consultant shall create specific sample projects (minimum of 5) to help illustrate to ITS Stakeholders how to determine whether or not to submit their specific projects for inclusion in the RA. A succinct technical memorandum will be developed (3 to 5 pages) for distribution to the Maintenance Committee.

Deliverables:

1.a Maintenance Committee Meeting #1

1.b RA Inclusion Criteria (technical memo)-Draft 1

1.c RA Inclusion Criteria (technical memo) Draft 2

1.d Final RA Inclusion Criteria (technical memo)

(deliver electronic copy of two drafts and of final: print-ready (single pdf file) electronic file of final as well as original electronic files of any and all components for MTC's files)

Task 2: Streamline RA

Consultant shall explore alternative approaches to organizing the RA so that it better meets the needs of people responsible for project design and project funding.

Depending on findings, the approach to updating the RA (as outlined in the rest of this scope of work) may need to be modified.

- A. Consultant shall perform a high-level review of the architectures for three other regions similar to the Bay Area to determine if there are better ways to organize or simplify our RA.
- B. Consultant shall conduct a critical assessment of the existing RA to determine which sections of the document are useful (and to whom) and which could be eliminated

- C. Consultant shall develop options for consideration by the Maintenance Committee about how to streamline the existing RA format so that it is easier to understand and use. Consultant shall lead discussions with the Maintenance Committee to build consensus around a preferred approach. Depending on the outcome of this discussion, the approach detailed in the rest of this scope of work may need to be modified.
- D. A technical memorandum will be developed that documents the findings and recommendations of this task. A succinct technical memorandum(3 to 5 pages) will be developed for distribution to the Maintenance Committee.

Deliverables:

- 2.a Summary of streamline findings and recommendations (technical memo) Draft 1 to MTC**
- 2.b Summary of findings and recommendations (technical memo) Draft 2 to Maintenance Committee)**
- 2.c Final Summary of findings and recommendations (technical memo) (deliver electronic copy of two drafts and of final: print-ready (single pdf file) electronic file of final as well as original electronic files of any and all components for MTC's files)**
- 2.d Project Website Establishment & Maintenance**

Task 3: Inventory Update

Consultant shall update regional inventory of ITS projects.

- A. Following the approach to outreach and consistent with the RA Inclusion Criteria, Consultant shall solicit ITS project additions, deletions and status changes from all transportation stakeholders in the region via letter, e-mail and/or phone. Consultant will update existing and identify new regional ITS projects to include in the ITS project inventory, including:
 - 1. Existing projects submitted too late for inclusion in the original RA (see Sections 13.3 of the RA adopted in October 2004);
 - 2. Existing projects reviewed and approved by the Maintenance Committee since October 2004;
 - 3. Existing projects not yet reviewed by the Maintenance Committee; and
 - 4. New projects not yet submitted for inclusion in the RA.
- B. Building on the RA Inclusion Criteria, Consultant shall serve as a technical resource for all stakeholders to assist with determinations about whether or not a particular project should be included in the RA and how to accurately reflect projects in the RA. Up to 20 hours is budgeted for this effort. This work element is included in the "Updated Project Database and Requested Queries" milestone for payment. This milestone' content is described in item F of this task. Upon delivery of the "Updated Project Database & Requested Queries" milestone, the work element will be payable.
- C. Information to be gathered by Consultant for each ITS project includes a name, associated stakeholder(s), a concise description, general status, and the associated subsystems or terminators from the National ITS Architecture. This core information will be supplemented with specific location information, points of contact, other references, and various implementation details as needs dictate. The

region should establish the information that is required for each inventory element based on the needs of the region and available resources.

- D. Consultant shall conduct a stakeholder workshop. Consultant shall prepare an agenda and workshop materials in advance, and review them with the MTC Task Leader for approval. The goal of the workshop is to:
- Provide background information and context for the RA Update;
 - Present the RA Inclusion Criteria;
 - Submit a copy of the draft inventory;
 - Conduct an interactive group exercise to revisit the original list of stakeholder needs for potential revision as a part of this RA Update;
 - Conduct an interactive group exercise to revisit the original list of services/market packages for potential revision as a part of this RA Update;
 - Conduct an interactive group exercise using sample projects to help stakeholders self-determine which ITS projects to include in the RA;
 - Reconfirm stakeholder contact information; and
 - Solicit changes in ITS projects.
- E. Consultant shall track requested changes from the ITS stakeholders in a disposition table as an official record of the outreach process, and specify the ultimate rationale for or against including each project in the RA. In consultation with the MTC Task Lead, the Consultant shall specify a point in time after which changes will no longer be considered for the RA Update. However, Consultant shall maintain a record of all changes proposed after this point in time for future consideration as part of the RA maintenance process. This record will be maintained through the completion of the RA Update.
- F. Consultant shall document actual changes in ITS project information by updating the ITS project database used for the original RA. Consultant shall perform queries on the database as requested by the MTC Task Leader for analysis purposes. Consultant should also develop an easy-to-read summary of the inventory of ITS projects.
- G. Consultant shall review the portions of SAFETEA-LU, the California Governor's Strategic Growth Plan, the California Statewide Architecture and the Corridor Mobility Improvement Account that could potentially have an impact on the RA, and make changes to the list of regional ITS projects and the RA as appropriate.
- H. Once complete, the baseline inventory will be in place for the update to be based upon. Additional comments or suggestions for changes will be documented and considered on a case-by-case basis following the establishment of this baseline. It is anticipated that most or all of the subsequent comments or changes will be deferred for a future update.

Deliverables:

- 3.a Stakeholder Workshop #1 and materials**
- 3.b Disposition table documenting stakeholder participation**
- 3.c Maintenance Committee Meeting #2**
- 3.d Updated ITS Project Database (and queries as requested)**
- 3.e Updated ITS Stakeholder List**
- 3.f Updated ITS Inventory**
- 3.g Project Website Maintenance**

Task 4: RA Update

Consultant shall update the existing RA as a Turbo Architecture database (a software tool used to facilitate system architecture interconnections and data flows) and as a hyperlinked Internet Website.

- A. ITS Services (e.g. Market Packages) – Based on the revised list of ITS projects for the region, and other feedback collected at the first workshop (described above) Consultant shall update information about the kinds of ITS services offered in the Bay Area relevant to those detailed in the National ITS Architecture. Consultant shall update the matrix documenting for each potential ITS service whether it is existing, planned or not planned. The updated matrix will include a priority ranking (such as high, medium or low) of the integration/inter-operable needs in the region as the importance of various projects will be deliberated at the regional level during the next regional transportation planning process. The matrix should also reflect the number and scope of deployments of each type of service in the region as reported by the stakeholders at the workshop and through Consultant's other outreach efforts.
- B. Operational Concepts – Consultant shall refine the existing operational concepts as defined in the original RA to reflect the current state and future direction of ITS in the region. This task will focus on documenting critical relationships between ITS projects, key functions performed by each project, information produced by each project and which projects use this information. To accomplish this task, Consultant will need to confirm existing and new operational concepts with all appropriate stakeholders.
- C. Functional Requirements – Consultant shall update the functional requirements that detail at a high level what each regional ITS project must do to enable integration with other ITS projects for data exchange. Functional Requirements will be developed at a very high level for the Bay Area Architecture in order to keep the architecture open for ease of use and future updating by stakeholders.
- D. Information Flows and Interconnects – Building on the original RA, and given the updated list of ITS projects and revised ITS services, operational concepts and functional requirements, Consultant will use the current release version of Turbo Architecture to explore options for connecting ITS projects in the region together. Consultant shall review the various options with ITS stakeholders for feedback in order to determine the best RA. Consultant shall produce a revised, one-page high-level diagram of the RA, which shows connections and information flows between regional ITS systems. Consultant shall also update a more detailed version of the RA documenting connections and information flows at the level necessary to develop an open and comprehensive architecture update for the Bay Area.
- E. Standards – Consultant shall update information about regional and national standards relative to the regional ITS services. Consultant shall prepare a short discussion of standards information to help explain their importance and how they impact stakeholders and projects (in a generic sense) in the Bay Area. The discussion will include such topics as;
 - Referencing existing, on-line resources for standards education and use;

- An explanation of several key standards that impact major regional projects such as for data sharing; and
- Recommendations for how to support use of standards in the future. (e.g. What should MTC's advice to project sponsors be regarding standards and how to make sure the most current ones are used?).

Careful consideration will be given to the audience and language used in communicating about standards. Standards information in the Turbo Architecture database files will be updated as a part of this RA Update.

- F. Interagency Agreements – Consultant shall update a list of interagency agreements required by the RA to ensure the smooth flow of information between ITS stakeholders and identify any barriers to agreement execution.
- G. Consultant shall conduct a stakeholder workshop/meeting. Consultant shall prepare an agenda and materials in advance, and review them with the MTC Task Leader for approval. The goal of the workshop/meeting is to present and collect feedback on preliminary draft material for the subtasks of Task 4:
 - Operational Concepts
 - Functional Requirements
 - Information Flows and Interconnects
 - Standards
 - Interagency Agreements

Deliverables:

- 4.a Stakeholder Workshop #2**
- 4.b Maintenance Committee Meeting #3**
- 4.c Updated matrix of ITS services**
- 4.d Updated operational concepts (section of summary report to be delivered in Task 5)**
- 4.e Updated functional requirements (database)**
- 4.f Updated high-level (one-page) and detailed views of the RA (e.g. information flows and interconnects) as a Turbo Architecture database and as a hyperlinked Internet website**
- 4.g Updated standards information (section of summary report to be delivered in Task 5)**
- 4.h Updated matrix of interagency agreements**
- 4.i Project Website Maintenance**

Task 5: Final Documentation

Consultant shall document the updated RA resulting from the previous tasks and related findings as a technical report. Consultant shall also produce an executive summary geared toward a policy-maker audience resulting from the updated RA. The final technical and summary reports shall be organized in a way that is easy to reproduce in-house for future printing purposes. Consultant shall also prepare a PowerPoint presentation of 10 or fewer slides summarizing components of the RA Update that may be of interest to policy-makers for presentation by MTC staff to Commission for approval.

A. Consultant shall produce a final technical report that updates the existing RA (see Bay Area Regional ITS Architecture and Strategic Plan from October 2004 for an example), including topics covered in the following chapters:

- (Technical) Executive Summary (up to 5 pages)
- Introduction (up to 2 pages)
- Bay Area ITS Focus (up to 2 pages)
- Regional Boundaries (up to 2 pages)
- ITS Inventory
- ITS Users' Needs and Services
- Operational Concepts
- Functional Requirements
- High-Level Architecture
- Relevant Standards
- Regional Bay Area ITS Projects
- Logical Project Sequencing (as applicable)
- List of Agency Agreements
- Use and Maintenance of the Architecture (up to 2 pages)
- Tables and Figures, as appropriate

Consultant may organize information in the RA Update differently than the original RA to improve readability and comprehension by project planning, funding and procurement staff. Ease of future updating of the RA will be taken into consideration in drafting this report. The technical report will consist primarily of content as developed in Task 4 with several new sections. It is understood that text from the previous version of the architecture will not be rewritten or revised, however if sections are to be reused they will be credited to the original author. The technical report is envisioned to be 60 – 80 pages plus technical appendices as developed in previous tasks. **(Deliver electronic copy of two drafts and of final: print-ready (single pdf file) electronic file of final as well as original electronic files of any and all components for MTC's files)**

B. Consultant shall produce a final executive summary geared toward policy-makers to summarize the state of ITS in the region to inform the next regional transportation plan, recognizing that the Commission will make decisions on ITS policy as adopted through the regional transportation plan. At a minimum, the report shall include a high level discussion of:

- ITS integration and deployment strategy for the region,
- Regional ITS priorities,
- Partner roles and partner capacity to implement/integrate ITS,
- Gaps and opportunities in ITS project planning and integration (such as institutional, funding and/or technical gaps that impede progress toward executing the RA),
- Recommended modifications to the existing RA and/or project architectures to promote an integrated system, and
- Recommended approach to RA maintenance.

It is envisioned that this summary will be 5 to 10 pages in length and will be written as a stand-alone document. **(Deliver electronic copy of two drafts and**

of final: print-ready (single pdf file) electronic file of final as well as original electronic files of any and all components for MTC's files)

Deliverables:

- 5.a Draft 1(copy ready) RA Update (technical report) to MTC**
- 5.b Draft 2 (copy ready) RA Update (technical report) to Maintenance Committee**
- 5.c Final RA Update (technical report)**
- 5.d Draft 1 (copy ready) RA Update (executive summary report) to MTC**
- 5.d Draft 2 (copy ready) RA Update (executive summary report) to Maintenance Committee**
- 5.e Final (copy ready) RA Update (executive summary report)**
- 5.f Draft 1 PowerPoint Presentation to MTC**
- 5.g Draft 2 PowerPoint Presentation to Maintenance Committee**
- 5.h Final PowerPoint Presentation**
- 5.i Project Website Maintenance**
- 5.j Record of changes after deadline**

Task 6: Outreach Strategy and Education

Consultant shall develop an outreach strategy to disseminate the Final RA Update and educate project planning, procurement and funding staff about how to use it.

- A. Develop an outreach strategy (primarily electronic) to disseminate the Final RA Update. Implement the outreach strategy. The strategy is envisioned to primarily use the web site as a storage and organization location and e-mail as a primary communication medium. This task does not include budget for marketing materials, new graphics, or printing.
- B. Consultant shall develop and implement a strategy to educate project planning, procurement and funding staff about how to use the RA. The strategy should be specific to the needs of each type of staff. It is envisioned that this communication will be similar in size and nature to the current page on the RA web site: it is envisioned to consist of one web page with links to approximately 6 other pages or answers, include several frequently asked questions or another form of quick and succinct reference for project sponsors and stakeholders. The strategy is envisioned primarily to use the web site as a storage and organization location and e-mail as a primary communication medium. This task does not include budget for marketing materials, new graphics, or printing.

Deliverables:

- 6.a RA Outreach Update Dissemination Strategy (technical memo) and Implementation**
- 6.b RA Update Usage Education Strategy (technical memo) and Implementation**
- 6.c Maintenance Committee Meeting #4**
- 6.d Project Website Maintenance**